Sugars and Fats in Our Food, Oh My!

Candice Autry
Sheridan School
Washington, DC

Jennifer Jordan
McNeil High School
Austin, TX

In collaboration with Pamela Allweiss,[1] Jenny Williams,[2] Paula Yoon,[3] and Heather Carter[2]

[1] National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention
[2] National Center on Birth Defects and Developmental Disabilities, Centers for Disease Control and Prevention
[3] National Office of Public Health Genomics, Centers for Disease Control and Prevention

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Summary
This lesson can be included in a unit about nutrition and health for middle school students. Students will learn about the amount of sugars and fats in typical foods they consume. They will use food labels and various measuring instruments to determine the amount of sugar and fat in serving sizes. This activity gives students a hands-on opportunity to explore food composition in the forms of sugars and fats. At the end of the lesson, students will begin to explore the association between food choices and health outcomes like obesity and diabetes.

Learning Outcomes

- Students will be able to identify the amount of sugar and fats in the foods they eat.
- Students will be able to use measuring instruments, such as triple-beam balances, spring scales, and electronic balances.
- Students will be able to communicate the amount of sugar and fats in common foods in the form of a display.
- Students will begin to understand the link between diet and diabetes and obesity.
- Upon completion of this lesson, students will be able to (1) understand how to read a nutrition label, (2) understand serving sizes, and (3) recognize the fat and sugar content of many common prepared foods.

Materials

1. 5 lb. sugar
2. 5–6 containers of solid vegetable shortening or margarine
3. 10–12 500 mL beakers
4. Plastic spoons and knives
5. Plastic bags
6. Newspapers
7. Small paper cups
8. Triple-beam balances, electronic, or other weighing instruments such as spring scales
9. Petri dishes or plastic cups
10. Masking tape
11. Art supplies (poster board or butcher paper, colored pencils, markers, scissors, glue or glue sticks, construction paper, etc.)
12. Various nutritional information food labels, a minimum of 25 different types of foods; good examples might include sports drinks, low-fat yogurt, chocolate cake, potato chips, cereal, apple sauce, milkshakes, salsa, baked potato chips, pretzels, etc.
13. Computers with Internet access for student use, one per group of four students
14. 2 drinking glasses
15. Measuring cups
16. Pitcher or other container that can hold liquid

Total Duration
2 hours, 25 minutes

Procedures

Teacher Preparation

Become familiar with how to read a nutrition label and other nutritional information using the websites "How to Understand and Use the Nutrition Facts Label," "Food and Nutrition Information Center," and "U.S. Department of Agriculture Database for the Added Sugars Content of Selected Foods." For more general information about nutrition, review the "CDC Division of Nutrition and Physical Activity" website.

Two to three days before this activity, give students the homework assignment to bring in at least four nutrition labels of various foods they eat. The labels should represent several different food groups. Have several nutrition labels on hand—including low-fat yogurt, potato chips, baked chips, pretzels, soda (both diet and non diet), and fruit juice—in case some students forget to bring in labels or are unable to complete the request.

Prepare the lab materials that each group will use: gather eight different nutrition labels for each lab group, place equal amounts of sugar in six 500 mL beakers, place a plastic spoon in each beaker, provide enough newspaper to cover lab tables for neatness, place a plastic knife in a tub of margarine or shortening, give each lab group one or two types of measuring instruments, and give each group 10–12 paper cups and 10–12 plastic bags. Test balances or other measuring instruments to be certain they are calibrated and in working order.

Prepare photocopies of the "What Do You Know About Sugar and Fat?" "What More Do You Know About Fat?" "How to a Read Nutrition Label," and the "Grading Rubric" for each student. Prepare one photocopy for each lab group of "Data Table for the Amount of Sugar in Represented Foods" and "Data Table for the Amount of Fat in Represented Foods."

Web Resources

Title: How to Understand and Use the Nutrition Facts Label
URL: www.cfsan.fda.gov/~dms/foodlab.html#twoparts
Description: This website from the Food and Drug Administration gives a clear, concise explanation about how to read, understand, and use the nutritional information on food products.

Title: Food and Nutrition Information Center
URL: www.nalusda.gov/fnic
Description: The Food and Nutrition Information Center's website has information about food composition, dietary guidelines, and the food guide pyramid.

Title: U.S. Department of Agriculture Database for the Added Sugars Content of Selected Foods
URL: www.nal.usda.gov/fnic/foodcomp/Data/add_sug/addsug01.pdf
Description: This Food and Nutrition Information Center website has information about the growing interest in added amount of sugars in the diet. The link is a PDF with 46 pages of examples of foods and added sugar content.

Title: Division of Nutrition and Physical Activity

URL: www.cdc.gov/nccdphp/dnpa/
Description: This website from CDC's Division of Nutrition and Physical Activity has information about proper nutrition and healthy diet, physical activity, and increases in obesity among the U.S. population.

Supplemental Documents
Title: What Do You Know About Sugar and Fat?
Description: This document is used to get students to think about how much sugar and fat is in some common foods.

Title: What More Do You Know About Fat?
Description: This document is used to get students to think about how much fat and the types of fat that are in some common foods.

Title: How to Read a Nutrition Label
Description: This document is used to help students identify several important parts of a nutrition label.

Title: Grading Rubric
Description: This document is used as a rubric for evaluating the students' displays.

Title: Data Table for the Amount of Sugar in Represented Food
Description: Students will use this lab data sheet to document the amount of sugar in different foods.

Title: Data Table for the Amount of Fat in Represented Food
Description: Students will use this lab data sheet to document the amount of fat in different foods.

Introduction **Duration: 10 minutes**

Begin the lesson by having students complete the "What Do You Know About Sugar and Fat?" worksheet. This activity is used to get students thinking about how much sugar and fat is in some common foods. After students have completed the worksheet, give students the correct answers. Students might be surprised by some of the findings. Follow this activity with the "What More Do You Know About Fats?" worksheet, which includes additional details on the different types of fats. For more detailed information on different types of fats, check out the "MedlinePlus: Fats" and "Know Your Fats" websites.

Web Resources
Title: MedlinePlus: Fat
URL: www.nlm.nih.gov/medlineplus/ency/article/002468.htm
Description: This website from the National Library of Medicine and the National Institutes of Health gives a good description of the different types of fats and the role they play in the body.

Title: Know Your Fats
URL: http://americanheart.org/presenter.jhtml?identifier=532
Description: This website from the American Heart Association gives a general description of the different types of fats and the role they play in the body and the types of fat that can be found in certain foods.

Supplemental Documents

Title: What Do You Know About Sugar and Fat?
Description: This document is used to get students to think about how much sugar or fat could be in some common foods.

Title: What Do You Know About Sugar and Fat? Answer Key
Description: This document is the answer key for the amount of sugar and fat in some common foods.

Title: What More Do You Know About Fat?
Description: This document is used to get students to think about the amount and types of fat that are in some common foods.

Title: What Do You Know About Fat? Answer Key
Description: This document is the answer key for the amount and types of fat that are in some common foods.

Step 2 **Duration: 20 minutes**

Hand out "How to Read a Nutrition Label." This document shows students where they can find important information like serving size, total calories, total fat content, and sugar content. Have students work alone or in pairs to identify the different sections of a nutrition label. Or, use this document as an overhead and have the class work together. You may also use the website "Eating Healthier and Feeling Better Using the Nutrition Facts Label" to walk the class through a typical nutrition label. The website "How to Understand and Use the Nutrition Facts Label" has much more detailed information about the nutrition label and can be used to show all aspects of a label, if you choose.

Once students are comfortable with identifying information on the nutrition label, introduce the concept of serving size. Place two drinking glasses and a container of liquid (representing juice) on a table. Ask for a volunteer to pour a typical amount of juice a student might drink in one of the glasses. Then pour 8 ounces of the liquid in the other glass. Students can see the potential differences between a standard serving (8 ounces) and what the student volunteer thought was a serving.

After demonstrating serving size, discuss what is meant by a serving size and give examples of typical serving sizes, if needed. Ask questions about serving sizes, such as:

- How many servings are in a 12-ounce soda? (1 ½ servings)
- How large is a serving size of macaroni and cheese? (½ of a cup, enough to approximately fit in the palm of a person's hand)
- How would you describe a serving size of meat? (3 ounces, approximately the size of a deck of cards)

Web Resources

Title: Eating Healthier and Feeling Better Using the Nutrition Facts Label
URL: www.cfsan.fda.gov/~acrobat/nutfacts.pdf
Description: This website from the U.S. Department of Agriculture and the Food and Drug Administration gives a good example of a food label, complete with descriptions of each part of the label and the information it provides to the consumer.

Title: How to Understand and Use the Nutrition Facts Label
URL: www.cfsan.fda.gov/~dms/foodlab.html#twoparts
Description: This Food and Drug Administration website gives a clear, concise explanation about how to read, understand, and use the nutrition information on food products.

Title: Food and Nutrition Information Center
URL: www.nalusda.gov/fnic
Description: The Food and Nutrition Information Center's website has information about food composition, dietary guidelines, and the food guide pyramid.

Title: U.S. Department of Agriculture Database for the Added Sugars Content of Selected Foods
URL: www.nal.usda.gov/fnic/foodcomp/Data/add_sug/addsug01.pdf
Description: The website from the Food and Nutrition Information Center provides information about the growing interest in added amount of sugars in the diet. The link is a PDF with 46 pages of examples of foods and added sugar content.

Supplemental Document
Title: How to Read a Nutrition Label
Description: This document is used to help students identify several important parts of a nutrition label.

Title: How to Read a Nutritional Label – Answer Key
Description: This document correctly identifies several important parts of a nutrition label.

Step 3 **Duration: 45 minutes**

After the discussion, divide students into groups of three or four and prepare to measure the amounts of fats and sugars found in the foods they eat. Give each group member a specific role in setting up the lab. One member should collect the group's lab materials (which you prepared ahead of time), one group member should spread newspaper on the tops of lab tables, and the other members should place the measuring tools and all other items in the center of the table.

Each group should have eight different nutrition labels and two data table worksheets. Have students fill out the "Data Table for the Amount of Sugar in Represented Foods" and the "Data Table for the Amount of Fat in Represented Foods." Information gathered will include the food item, the amount of sugar and fat listed on the label, the weight of the paper cup, and the first and second measurement. Students will also choose one food item to calculate the associated number of calories from either fat or sugar. A sample calculation is provided on the worksheet. Students work in groups to determine the correct calculations. Remind students that they will be using margarine or vegetable shortening to represent fat.

Have students measure out the correct amount of sugar and fat in paper cups. Remind students to weigh the paper cup before placing any sugar or fat in the cup. Once the groups have weighed each food item twice, they should transfer the sugar or fat to a plastic bag. Each plastic bag is labeled (with masking tape and a pen) with the food item, the amount of sugar and fat listed on the nutrition label, the two weight measurements, the weight of the cup, and the actual weight of the measured fat or sugar.

If students need assistance with using triple beam balances, they can use the website "Ask a Scientist" or "Making a Weighing" for tips on using triple beam balances.

Web Resources
Title: Ask a Scientist
URL: www.newton.dep.anl.gov/askasci/gen99/gen99154.htm

Description: The U.S. Department of Energy gives a website explaining how to use a triple beam balance.

Title: Making a Weighing
URL: http://genchem.rutgers.edu/balance3b.html
Description: This Rutgers University website gives an explanation with tips to help students successfully use a triple beam balance accurately.

Supplemental Documents
Title: Data Table for the Amount of Sugar in Represented Food
Description: Students will use this lab data sheet to document the amount of sugar in different foods.

Title: Data Table for the Amount of Fat in Represented Food
Description: Students will use this lab data sheet to document the amount of fat in different foods.

Step 4 **Duration: 45 minutes**

After each group has finished with the lab activity, have them create a visual display that communicates the amounts of sugars and fats in common foods. Provides students with art materials (poster board, butcher paper, colored pencils, markers, scissors, glue or glue sticks, construction paper, legal paper, crayons, etc.) and let them decide the best way to present the information. Hand out the "Grading Rubric" to students so they know how the display will be evaluated. Students can display their posters in the classroom or in the school.

Supplemental Document
Title: Grading Rubric
Description: This document is used as a rubric for evaluating the students' displays.

Conclusion **Duration: 25 minutes**

Now that students have a better understanding of the amount of sugars and fats that are found in foods, wrap up the activity by putting this information into a larger context. Show students several maps of the prevalence of obesity and diabetes in the United States using "Data and Trends, National Diabetes Surveillance System: State-specific Estimates of Diagnosed Diabetes Among Adults" and "Physical Activity and Good Nutrition: Essential Elements to Prevent Chronic Diseases and Obesity."

Ask students to interpret the graphs.

- What does the graph about obesity tell you? (In the majority of states, ≥25% of adults are considered obese, according to the Behavioral Risk Factor Surveillance Survey in 2004).
- What do you think would cause so many people to be obese? (Answers will vary but could include people eating more fast food, not many people exercising, etc.).
- What does the graph about diabetes tell you? (The majority of states have >6% of adults who have been diagnosed with diabetes, according to the National Diabetes Surveillance System in 2004).
- What do you think would cause so many people have diabetes? (Answers will vary but could include, other members of their family have it and there are more people who are obese, a risk factor for diabetes, etc.)

Discuss with students the many factors that play into someone becoming obese or someone having diabetes. Talk about the differences between type 1 diabetes and type 2 diabetes. According to CDC,

Type 1 diabetes (previously called insulin-dependent diabetes mellitus [IDDM] or juvenile-onset diabetes) develops when the body's immune system destroys cells in the pancreas that make the hormone insulin, which regulates blood glucose. This form of diabetes usually strikes children and young adults, but the disease can start at any age. Type 1 diabetes may account for 5% to 10% of all diagnosed cases of diabetes. Risk factors for type 1 diabetes may include autoimmune, genetic, and environmental factors. Type 2 diabetes was previously called non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes. Type 2 diabetes may account for about 90% to 95% of all diagnosed cases of diabetes. It usually begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas slowly loses its ability to produce insulin. Type 2 diabetes is associated with older age, obesity, family history of diabetes, history of gestational diabetes, impaired glucose metabolism, physical inactivity, and race/ethnicity. African Americans, Hispanic/Latino Americans, American Indians, and some Asian Americans and Native Hawaiians or Other Pacific Islanders are at particularly high risk for type 2 diabetes. Type 2 diabetes is being diagnosed more and more in children and adolescents.

One risk factor for obesity is the number of calories a person eats every day. Students now know how to calculate the number of calories associated with sugar and fats in the food. As a person's intake of calories increases (and if they are not physically active), they will probably gain weight. If this happens consistently, it could lead to obesity. Obesity is a risk factor for diabetes.

To give students a chance to learn more information about these two topics, instruct students to look at the websites "CDC's Diabetes FAQ," "National Diabetes Education Program," and "American Diabetes Association" and write one paragraph about obesity and diabetes. The paragraph should include three facts about obesity, three facts about diabetes, and a statement about how someone can reduce these risk factors (e.g., eat a healthy diet with more fruits and vegetables and exercise regularly).

Web Resources

Title: Data and Trends, National Diabetes Surveillance System: State-specific Estimates of Diagnosed Diabetes Among Adults
URL: www.cdc.gov/diabetes/statistics/prev/state/fPrevalence2004Total.htm
Description: CDC's diabetes website has maps of the prevalence of diabetes. This particular site shows the prevalence of diabetes for the year 2004.

Title: Physical Activity and Good Nutrition: Essential Elements to Prevent Chronic Diseases and Obesity
URL: www.cdc.gov/nccdphp/publications/aag/dnpa.htm
Description: This website from CDC has several maps of the changing prevalence of obesity in adults over time.

Title: CDC's Diabetes FAQ page
URL: www.cdc.gov/diabetes/faq/index.htm
Description: CDC's diabetes website covers frequently asked questions including general diabetes information for the teacher and students. More technical information and resources are also available at this site.

Title: National Diabetes Education Program
URL: www.ndep.nih.gov/diabetes/pubs/catalog.htm

Description: This NIH/CDC program website has background information on the control and prevention of both type 1and 2 diabetes. Information is also available in Spanish and several Asian/Pacific Islander languages.

Title: American Diabetes Association
URL: www.diabetes.org/about-diabetes.jsp
Description: The American Diabetes Association's website has frequently asked questions that includes general diabetes information. More technical information and resources are also available at this site.

Assessment

Informal assessment of a student's prior knowledge is assessed during the introductory class discussion. Other informal assessments occur with the "What Do You Know About Sugar and Fat?" and "What More Do You Know About Fat?" worksheets, the "How to Read a Nutrition Label" exercise, and the obesity and diabetes paragraph. Formal assessment for this activity is done with the "Data Table for the Amount of Sugar in Represented Food" and the "Data Table for the Amount of Fat in Represented Food" completed in step 3, and the visual display completed in Step 4.

Modifications

Extensions

For additional practice, students can determine annual differences in sugar and fat intake by calculating nutritional content of selected foods over time and then comparing two foods for the same time period. (i.e., pretzels versus potato chips).

To further explore diabetes, introduce an additional lesson plan on diabetes.

Web Resources

Title: Science Ambassador Lesson Plans: Why Can't I Have Sugar? All About Diabetes
URL: www.cdc.gov/ncbddd/folicacid/ambassador_pgm/lessonplans_diabetes.htm
Description: CDC's Science Ambassador Program has an introductory lesson plan on diabetes that can be adapted for middle school students.

Supplemental Document

Title: A Year in the Life
Description: This document takes students through sample calculations comparing two foods and their contribution to the intake of sugar and fat over a year.

Other Modifications

Students could be encouraged to share their displays in the nurse's office or in other high-traffic areas of the school.

Students could poll other peers or adults about the amount of fats and sugar in typical pre-packaged foods. Students could then make a graph comparing the hypotheses of the persons interviewed and the actual amounts of fats and sugars.

Education Standards

National Science Education Standards
SCIENCE AS INQUIRY, CONTENT STANDARD A:
As a result of activities in grades 5–8, all students should develop

- **Abilities necessary to do scientific inquiry**
- **Understandings of scientific inquiry**

SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES, CONTENT STANDARD F:
As a result of activities in grades 5–8, all students should develop

- **Personal health**
- **Risks and benefits**
- Science and technology in society

HISTORY AND NATURE OF SCIENCE, CONTENT STANDARD G:
As a result of activities in grades 5–8, all students should develop

- **Science as a human endeavor**

What Do You Know About Sugar and Fat?

Sugars and Fats in Our Foods, Oh My!
Jennifer Jordan and Candice Autry, 2006 Science Ambassador Program

Name_____ Class_____

1. Consider the following breakfast food items: one cup of low-fat fruit yogurt, one cup of Cocoa Puffs cereal, and a granola bar. Make a prediction ranking the amount of sugar from lowest to highest.

Lowest amount of sugar _____

Middle amount of sugar _____

Highest amount of sugar _____

2. Consider the following drinks: a serving of soda, one cup of fruit-flavored sports drink (like Gatorade), and one cup of orange juice. Make a prediction ranking the amount of sugar in these foods from lowest to highest.

Lowest amount of sugar_____

Middle amount of sugar _____

Highest amount of sugar _____

3. Consider the following snack food items: one cup of plain, hard, salted pretzels; one cup of plain, salted potato chips; and one cup of white, baked potato chips. Make a prediction ranking the amount of fat from lowest to highest.

Lowest amount of fat _____

Middle amount of fat _____

Highest amount of fat _____

4. Finally, consider the following food items: Mr. Goodbar chocolate bar, one cup of avocado, and one cup of white, baked potato chips. Make a prediction ranking the amount of fat in these foods from lowest to highest.

Lowest amount of fat_____

Middle amount of fat_____

Highest amount of fat_____

What Do You know About Sugar and Fat? – Answer Key

Sugars and Fats in Our Foods, Oh My!
Jennifer Jordan and Candice Autry, 2006 Science Ambassador Program

Name_____ Class_____

1. Consider the following breakfast food items: one cup of low-fat fruit yogurt, one cup of Cocoa Puffs cereal, and a granola bar. Make a prediction ranking the amount of sugar from lowest to highest.

Lowest amount of sugar Granola bar, hard, peanut (1 oz, ~1 bar) 9.63 grams of sugar [Note: 8 oz or ~8 bars have 77.02 grams of sugar]

Middle amount of sugar General Mills Cocoa Puffs breakfast cereal (1 cup) 14.10 grams of sugar

Highest amount of sugar Low-fat fruit yogurt 9 grams per 8 oz (1 cup) 45.67 grams of sugar

2. Consider the following drinks: a serving of soda, one cup of fruit-flavored sports drink (like Gatorade), and one cup of orange juice. Make a prediction ranking the amount of sugar in these foods from lowest to highest.

Lowest amount of sugar Gatorade, fruit-flavored (1 cup) 13.01 grams of sugar

Middle amount of sugar Carbonated beverage, cola with caffeine (1 cup) 22.03 grams of sugar

Highest amount of sugar Breakfast orange juice, with pulp from concentrate, prepared with water (1 cup) 27.62 grams of sugar

3. Consider the following snack food items: one cup of plain, hard, salted pretzels; one cup of plain, salted potato chips; and one cup of white, baked potato chips. Make a prediction ranking the amount of fat from lowest to highest.

Lowest amount of fat Pretzels, plain, hard, salted (1 cup) 5.96 grams of fat

Middle amount of fat White, baked potato chips (1 cup) 6.19 grams of fat

Highest amount of fat Potato chips, plain, salted (1 cup) 85.06 grams of fat

4. Finally, consider the following food items: Mr. Goodbar chocolate bar, one cup of avocado, and one cup of white, baked potato chips. Make a prediction ranking the amount of fat in these foods from lowest to highest.

Lowest amount of fat White, baked potato chips (1 cup) 6.19 grams of fat

Middle amount of fat Candy, Mr. Goodbar, chocolate bar (1.75 oz) (1 bar) 16.27 grams of fat

Highest amount of fat Raw avocado, cubed (1 cup) 21.99 grams of fat

Nutritional information was obtained from the U.S. Department of Agriculture National Nutrient Database for Standard Reference Available from URL: http://www.nal.usda.gov/fnic/foodcomp/search/.

What More do You Know About Fats?

Sugars and Fats in Our Foods, Oh My!
Jennifer Jordan and Candice Autry, 2006 Science Ambassador Program

Name_____ Class_____

Using the website www.nal.usda.gov/fnic/foodcomp/search/, look up each food and list the amount of total fat, saturated fat, and unsaturated fat. Then answer the questions.

Food item	Total fat	Saturated fat	Monounsaturated fat	Polyunsaturated fat
One cup (8 oz.) of plain, hard salted pretzels				
One cup (8 oz.) of plain, salted potato chips				
One cup (8 oz.) of white, baked potato chips				
Candies, Mr. Goodbar, chocolate bar (1.75 oz)				
One cup (8 oz.) of avocado, cubed				

1. What food had the highest total fat?

2. What food had the lowest total fat?

3. What food had the lowest saturated fat?

4. What food had the highest monounsaturated fat?

More information on fats: Some fats are better than other fats. Saturated fats can lead to an increase in cholesterol levels. Unsaturated fats do not. According to the American Heart Association, unsaturated fats might even help lower cholesterol if eaten with a low saturated fat diet. Based on this information, why would an avocado be better for you than a chocolate bar?

What More Do You Know About Fats? – Answer Key

Sugars and Fats in Our Foods, Oh My!
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Name_____ Class_____

Using the website www.nal.usda.gov/fnic/foodcomp/search/, look up each food and list the amount of total fat, saturated fat, monounsaturated fat, and polyunsaturated fat. Then answer the questions.

Food item	Total fat	Saturated fat	Monounsaturated fat	Polyunsaturated fat
One cup (8 oz.) of plain, hard salted pretzels	5.96 grams	1.13 grams	2.77 grams	2.51 grams
One cup (8 oz.) of plain, salted potato chips	85.06 grams	24.85 grams	22.31 grams	27.60 grams
One cup (8 oz.) of white, baked potato chips	6.19 grams	0.89 grams	3.36 grams	1.44 grams
Candies, Mr. Goodbar, chocolate bar (1.75 oz)	16.27 grams	6.92 grams	4.01 grams	2.13 grams
One cup (8 oz.) of avocado, cubed	21.99 grams	3.18 grams	14.69 grams	2.72 grams

1. What food had the highest total fat?
   One cup of the plain, salted potato chips (84.98 grams)

2. What food had the lowest total fat?
   One cup of the plain, hard salted pretzels (5.96 grams)

3. What food had the lowest saturated fat?
   One cup of the white, baked potato chips (0.89 grams) followed by the plain, hard salted pretzels (1.13 grams)

4. What food had the highest monounsaturated fat?
   One cup of the plain, salted potato chips (22.31 grams) followed by the one cup of avocado, cubed (14.69 grams)

More information on fats: Some fats are better than other fats. Saturated fats can lead to an increase in cholesterol levels. Unsaturated fats do not. According to the American Heart Association, unsaturated fats might even help lower cholesterol if eaten with a low saturated fat diet. Based on this information, why would an avocado be better for you than a chocolate bar?
Both the avocado and the candy bar are high in fat. However, the avocado has more mono- and poly-unsaturated fats and less saturated fat than the candy bar. It is important to remember that although fats are a necessary part of a diet, total fat intake still needs to be limited.

How to Read Nutrition Label

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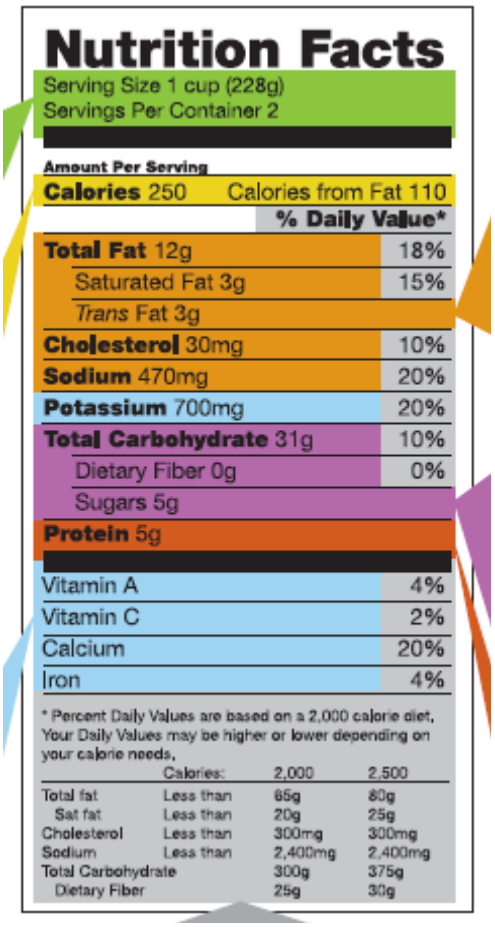
Directions: Identify the following items on the nutrition label: (1) serving size, (2) total calories, (3) total fat content, (4) total saturated fat content, (5) total sugar content, and (6) total protein content.



Nutrition Facts

Serving Size 1 cup (228g)
Servings Per Container 2

Amount Per Serving

Calories 250	Calories from Fat 110
	% Daily Value*
Total Fat 12g	18%
Saturated Fat 3g	15%
Trans Fat 3g	
Cholesterol 30mg	10%
Sodium 470mg	20%
Potassium 700mg	20%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
Iron	4%

* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

	Calories:	2,000	2,500
Total fat	Less than	65g	80g
Sat fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Taken from U.S. Department of Agriculture and Food and Drug Administration. How to Understand and Use the Nutrition Facts Label [online]. 2006 Aug. [cited 2007 Feb 12]. Available from URL: http://www.cfsan.fda.gov/~acrobat/nutfacts.pdf.

How to Read Nutrition Label – Answer Key

Sugars and Fats in Our Foods, Oh My!
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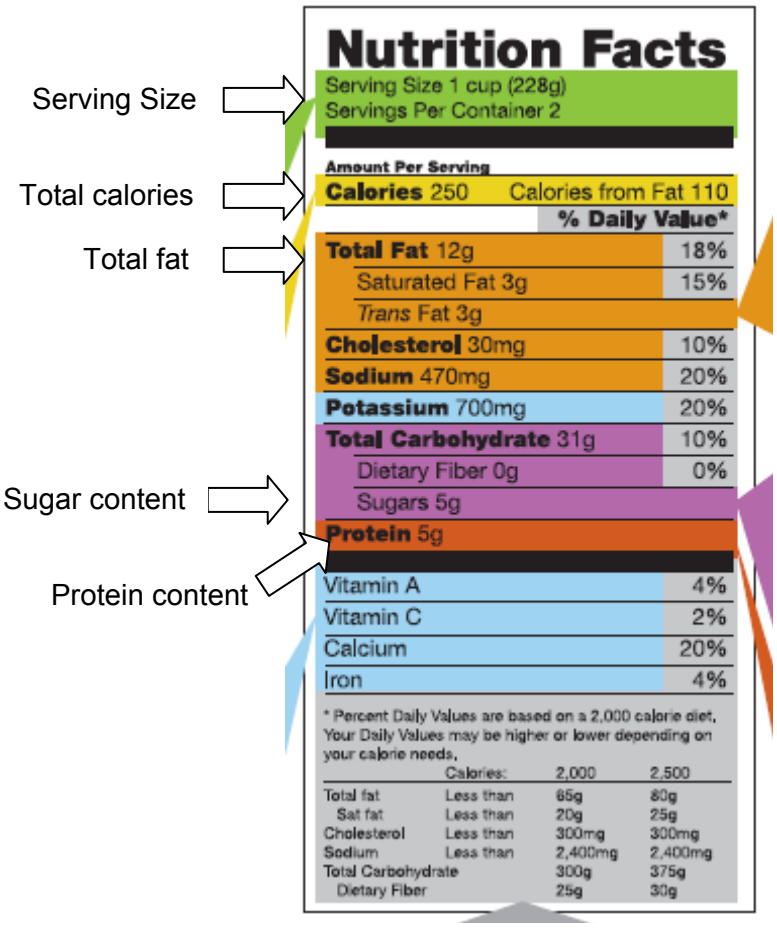
Directions: Identify the following items on the nutrition label: (1) serving size, (2) total calories, (3) total fat content, (4) total saturated fat content, (5) total sugar content, and (6) total protein content.



Taken from U.S. Department of Agriculture andFood and Drug Administration. How to Understand and Use the Nutrition Facts Label [online]. 2006 Aug. [cited 2007 Feb 12]. Available from URL: http://www.cfsan.fda.gov/~acrobat/nutfacts.pdf.

Data Table for the Amount of Sugar in Represented Food

Sugars and Fats in Our Foods, Oh My!
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Group Members _____ Class_____

_____

_____

_____

Food item	Weight of paper cup	First measurement	Second measurement	Average total weight	Weight of sugar (average total weight – weight of paper cup)

Calculations: Pick one food item from the items you have just measured. Your group will use this item to estimate a total intake over the course of a year and then calculate the amount of sugar that will equal for a year. For your calculations, use a total of six servings per week. You will also calculate how this intake will translate into calories per year. Follow the example below. Do not use the same items as used in the example. You must show all your work. You will turn in one copy for the entire lab group. Make sure you use proper units and that it is clear what your numbers represent.

Example:
Name of food item potato chips (plain, salted)
Serving size: 28 g Number of servings you eat per week: 6
Grams of sugar per serving: 0.1 g

Calculate grams of sugar per year for food 1:

Grams of sugar per serving	X	Number of servings per week	X	Number of weeks the year	=	Grams of sugar per year for food item
0.1 g	X	6 servings	X	52 weeks	=	31.2 g

Every gram of sugar you consume equals 4 calories. **Calculate the number of calories from sugar for this food item:**

Grams of sugar per year for food item	X	4 Calories/gram	=	Calories per year
31.2 g	X	4 Calories/gram	=	124.8 Calories

Nutritional information was obtained from the U.S. Department of Agriculture National Nutrient Database for Standard Reference Available from URL:
http://www.nal.usda.gov/fnic/foodcomp/search/.

Calculations:
Name of food item_____
Serving size:_____ Number of servings you eat per week: 6
Grams of sugar per serving: _____

Calculate grams of sugar per year for food 1:

Grams of sugar per serving	X	Number of servings per week	X	Number of weeks the year	=	Grams of sugar per year for food item
_____	X	6 servings	X	52 weeks	=	_____

Every gram of sugar you consume equals 4 calories. **Calculate the number of calories from sugar for this food item:**

Grams of sugar per year for food item	X	4 Calories/gram	=	Calories per year
_____	X	4 Calories/gram	=	_____

Data Table for the Amount of Fat in Represented Food

Sugars and Fats in Our Foods, Oh My!
Jennifer Jordan and Candice Autry, 2006 Science Ambassador Program

Group Members _____ Class_____

_____

_____

_____

Food item	Weight of paper cup	First measurement	Second measurement	Average total weight	Weight of fat (average total weight – weight of paper cup)

Calculations: Pick one food item from the items you have just measured. Your group will use this item to estimate a total intake over the course of a year and then calculate the amount of fat that will equal for a year. For your calculations, use a total of six servings per week. You will also calculate how this intake will translate into calories per year. Follow the example below. Do not use the same items as used in the example. You must show all your work. You will turn in one copy for the entire lab group. Make sure you use proper units and that it is clear what your numbers represent.

Example:
Name of food item potato chips (plain, salted)
Serving size: 28 g Number of servings you eat per week: 6
Grams of fat per serving: 10.62 g

Calculate grams of fat per year for food item:

Grams of fat per serving	X	Number of servings per week	X	Number of weeks the year	=	Grams of fat per year for food item
10.62 g	X	6 servings	X	52 weeks	=	3,313 g

Every gram of fat you consume equals 9 calories. **Calculate the number of calories from fat for this food item:**

Grams of fat per year for food item	X	9 Calories/gram	=	Calories per year
3,313 g	X	9 Calories/gram	=	29,817 calories

Nutritional information was obtained from the U.S. Department of Agriculture National Nutrient Database for Standard Reference Available from URL:
http://www.nal.usda.gov/fnic/foodcomp/search/.

Calculation:
Name of food item _____
Serving size:_____ Number of servings you eat per week: 6
Grams of fat per serving: _____

Calculate grams of fat per year for food item:

Grams of fat per serving	X	Number of servings per week	X	Number of weeks the year	=	Grams of fat per year for food item
_____	X	6 servings	X	52 weeks	=	_____

Every gram of fat you consume equals 9 calories. **Calculate the number of calories from fat for this food item:**

Grams of fat per year for food item	X	9 Calories/gram	=	Calories per year
_____	X	9 Calories/gram	=	_____

Grading Rubric

Sugars and Fats in Our Foods, Oh My!
Jennifer Jordan and Candice Autry, 2006 Science Ambassador Program

Group displays will be graded based on the following:

Category	4	3	2	1
Attractiveness	The display is exceptionally attractive and eye-catching. It provides a wide variety of food sources to educate the reader.	The display is attractive. It provides a wide variety of food sources to educate the reader.	The display is attractive, but it does not provide a wide variety of food sources to educate the reader.	The display lacks attention to detail in the presentation of information. There is not a wide variety of food sources to educate the reader.
Organization of Information	Information is well organized and easy to understand. It catches and keeps the readers attention.	Information is well organized and easy to understand.	Information is well organized, but it is confusing to the reader.	Information is disorganized and confusing to the reader.
Accuracy of Measurements	Measurements are precise and accurate according to the nutrition label for all of the foods.	Measurements are precise and accurate according to the nutrition label for most of the foods.	Measurements are precise and accurate according to the nutrition label for a few of the foods.	Measurements are precise and accurate according to the nutrition label for none of the foods.

A Year in the Life

Sugars and Fats in Our Foods, Oh My!
Candice Autry and Jennifer Jordan, CDC's 2006 Science Ambassador Program

Name _____ Date _____

To complete your work with sugars and fats, you will be looking at the amount of fat and sugar in two different foods. For each pair of food items, you will need to estimate your total intake over the course of the year and then calculate the amount of sugar and fat that will equal for a year. Follow the example below. Do not use the same items as those used in the examples. You must show all your work on your own paper. Make sure you use proper units and that it is clear what your numbers represent. Your teacher will tell you how many pairs of items you should compare.

Example:
Name of food 1: potato chips (plain, salted)
Serving size: 28 g Number of servings you eat per week: 6
Grams of sugar per serving: 0.1 g Grams of fat per serving: 10.62 g
Total calories per serving: 155 kcal

Calculate grams of sugar per year for food 1:

Grams of sugar per serving	X	Number of servings per week	X	Number of weeks the year	=	Grams of sugar per year for food 1
0.1 g	X	6 servings	X	52 weeks	=	31.2 g

Calculate grams of fat per year for food 1:

Grams of fat per serving	X	Number of servings per week	X	Number of weeks the year	=	Grams of fat per year for food 1
10.62 g	X	6 servings	X	52 weeks	=	3,313 g

Name of food 2: pretzels (plain, hard, salted)
Serving size: 28 g Number of servings you eat per week: 6
Grams of sugar per serving: 0.78 g Grams of fat per serving: 0.75 g
Total calories per serving: 108 kcal

Calculate grams of sugar per year for food 2:

Grams of sugar per serving	X	Number of servings per week	X	Number of weeks the year	=	Grams of sugar per year for food 2
0.78 g	X	6 servings	X	52 weeks	=	243 g

Calculate grams of fat per year for food 2:

Grams of fat per serving	X	Number of servings per week	X	Number of weeks the year	=	Grams of fat per year for food 2
0.75 g	X	6 servings	X	52 weeks	=	234 g

Compare the amount of fat and sugar from food 1 and food 2. List some of the differences for each food in terms of amount of calories per serving, grams of sugar per serving, and grams of fat per serving.

Food 1 (potato chips) has more fat and calories per serving than food 2 (pretzels). Pretzels have a higher sugar content than potato chips.

Nutritional information was obtained from the U.S. Department of Agriculture National Nutrient Database for Standard Reference Available from URL:
http://www.nal.usda.gov/fnic/foodcomp/search/.